

Claims

[c1] I claim:

A well flow control device, comprising:
a conduit having an aperture for communicating with a
target reservoir; and
a one-way valve in the aperture.

- [c2] The well flow control device of claim 1, wherein an end of the one-way valve is substantially flush with a surface of a wall of the conduit.
- [c3] The well flow control device of claim 1, wherein the conduit comprises a base pipe of a sand screen.
- [c4] The well flow control device of claim 1, wherein the one-way valve is oriented to limit flow into the conduit.
- [c5] The well flow control device of claim 1, wherein the one-way valve is oriented to limit flow from the conduit.
- [c6] The well flow control device of claim 1, further comprising:
the conduit has a plurality of apertures;
at least a portion of the apertures have the one-way valves mounted therein.

- [c7] The well flow control device of claim 6, further comprising the concentration of the apertures varies along the length of the conduit.
- [c8] The well flow control device of claim 1, wherein the valve is responsive to fluid flow through the valve.
- [c9] A method for controlling well fluid communication between an interior and an exterior of a conduit having an aperture for communicating with the target reservoir, comprising:
 - allowing flow in one direction through the aperture while restricting flow in an opposite direction using a valve positioned in the aperture.
- [c10] The method of claim 9, further comprising limiting inflow into the conduit through the aperture.
- [c11] The method of claim 10, further comprising limiting flow-back into the conduit.
- [c12] The method of claim 9, further comprising limiting outflow from the conduit through the aperture.
- [c13] The method of claim 12, further comprising limiting cross-flow in the well.
- [c14] The method of claim 9, further comprising:

providing a plurality of apertures in the conduit, at least a portion of the apertures having one-way valves therein; and varying the spacing of the valves.

- [c15] A well control valve, comprising a housing adapted for mounting within a substantially radially extending port in a well conduit; and a valve member in the housing adapted to control flow through the housing.
- [c16] A system for controlling fluid flow in a well, comprising: a conduit extending into the well, having a substantially radial aperture; a valve mounted within the aperture adapted to limit flow through the aperture.
- [c17] The system of claim 16, further comprising: the conduit forming part of a completion string; an in-line valve in the completion string.
- [c18] The system of claim 16, further comprising: the conduit has a plurality of radial apertures along its length and the concentration of the apertures is varied to achieve a desired flow regime; one-way valves are mounted in at least a portion of the radial apertures.

- [c19] The system of claim 16, further comprising:
 - the conduit forming part of a completion string;
 - a packer in the completion string;
 - the conduit extends on both sides of the packer and has a radial aperture on either side of the packer;
 - a one-way valve in at least one of the radial apertures limits flow from an interior of the conduit to an exterior of the conduit.
- [c20] The system of claim 16, further comprising a filter media mounted to the conduit covering the aperture.
- [c21] A well injection control device, comprising:
 - an injection conduit having a plurality of substantially radial apertures;
 - a check valve mounted within at least a portion of the apertures, the check valve is adapted to allow flow therethrough from an interior to an exterior of the injection conduit, but limit flow therethrough from the exterior to the interior.
- [c22] The device of claim 21, further comprising a filter media covering the apertures.
- [c23] A method for injecting a fluid into a well, comprising:
 - injecting the fluid through a plurality of apertures in an injection conduit placed in the well;

limiting the flow of fluid from a target reservoir into the injection conduit with a check valve mounted within at least a portion of the apertures.

- [c24] The method of claim 23, further comprising dampening a water hammer affect with the limiting step.
- [c25] The method of claim 23, further comprising limiting channeling by varying a concentration of the apertures.
- [c26] A well production control device, comprising:
 - a production conduit having a plurality of substantially radial apertures;
 - a check valve mounted within in at least a portion of the apertures, the check valve is adapted to allow flow therethrough from an exterior to an interior of the production conduit, but limit flow therethrough from the interior to the exterior.
- [c27] The device of claim 21, further comprising a filter media covering the apertures.
- [c28] A method for producing a fluid from a well, comprising:
 - producing the fluid through a plurality of substantially radial apertures in a production conduit placed in the well;
 - limiting the flow of fluid from the production conduit to a target reservoir with a check valve mounted within at

least a portion of the apertures.

- [c29] The method of claim 28, further comprising limiting cross-flow with the limiting the flow of fluid step.
- [c30] The method of claim 28, further comprising limiting coning by varying a concentration of the apertures.